PATENT ABSTRACTS OF JAPAN

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(54) RECORDING METHOD

(57)Abstract:

PURPOSE: To improve the quality of picture data in moving picture compression-encoded data recording by controlling an MPEG encoder corresponding to a prescribed operation.

CONSTITUTION: When the trigger switch 20A of an operation part 16 is operateda camera 10 and the MPEG encoder 12 are controlled in a control part 16 and moving picture information from the camera 10 is converted into MPEG signals in the encoder 12 and recorded in a magneto-optical disk 14. At the timewhen the shutter switch 20B of the operation part 16 is operatedthe quantization width of pictures in the encoder 12 is forcedly set finely and recording as one high quality picture is performed on the disk 14. Alsowhen a memory for storing the picture is provideda desired moving picture is displayed as a still picture after moving picture display.

CLAIMS

[Claim(s)]

[Claim 1]A record method which will raise and record quality of image data at the time of this operation if it sets during record of animation compression coded data and succeeds in predetermined operation.

[Claim 2]A record method of claim 1 which said animation compression coded data is MPEG signal dataand is that raising quality of image data creates I picture.

[Claim 3]A record method of claim 1 which is raising quality's of said image data enlarging image sizemaking quantization width fineor lowering a numerals compression ratio.

[Claim 4]A record method which will evacuate image data at the time of this operationand will record said image data to which it was made to evacuate out of a recording animation period if it succeeds in operation of still picture record into a recording animation.

[Claim 5]A record method of claim 4 which said moving image signal is compressed by an animation compression encoding systemand is recordedand image data at the time of said operation is compressed by a still picture compression encoding systemand is recorded.

[Claim 6]A record method of claim 5wherein said still picture compression encoding system is a JPEG system.

[Claim 7]A record method which will memorize recording position information in said recording medium (14A) of image data at the time of this operationand will write said memorized recording position information in said recording medium (14A) at outside of a recording animation period if it succeeds in predetermined operation in a recording animation to a recording medium (14A).

[Claim 8]A record method of claim 7 which will raise quality of image data at the time of this operationand will be memorized to said recording medium (14A) if it succeeds in said predetermined operation.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention relates to the record method of moving image recorderssuch as a camcorder. Especially this invention relates to the camcorder (camera integral-type recorder) which carries out record reproduction of the MPEG signal.
[0002]
[Description of the Prior Art]As a device which records a picture signalthe camcorder/movie and the electronic "still" camera are known well. This camcorder/movie is an object for animationsand it is photoed to record an animation. An electronic "still" camera is an object for still picturesand a photograph is taken to carry out record reproduction of the high-definition picture even if there is no motion.
[0003]These both function is made to only unite and the apparatus which an animation and a still picture can record by one set is also proposed. The apparatus which records the same photographic subject on the time with an animation and a still picture is proposed by JP4-329085A (H04N5/91). Howeverin this examplea recording animation field and a still picture record section will be intermingled.
[0004]An object of this invention is to provide the camcorder which can record the picture of two kinds of grace on another record section comparatively freely like the picture (for exampleanimation) of the usual image qualityand the high-definition picture (for examplestill picture) of image quality. Although an

opportunity completely differs from this applicationthe magnetic recording medium which can divide and set up the record section of the picture (for exampleanimation) of the usual image quality and the record section of the picture (for exampleone scene of the animation for indexes) of the image quality of a low grade is proposed by JP4-326883A (H04N5/92).

[0005]Howeveralthough the art which records the picture of one scene of an animation on a record section other than a recording animation fieldand the art which records the picture a user expects at the time of reproduction on another record section are indicated by this conventional exampleSince it is not aimed at the camcorderthere is no way of thinking of recording the picture for which a user wishes at the time of a recording animation on another record section. Other purposes of this invention are explained.

[0006]An object of this invention is to provide the camcorder of easy composition of that the picture of two kinds of grace is recordable like the picture (for exampleanimation) of the usual image qualityand the high-definition picture (for examplestill picture) of image quality. Although an opportunity completely differs from this applicationthe magnetic recording medium which lowers the compression ratio of a recorded image signal in a predetermined caseand records a high-definition picture on it is proposed by JP4-269086A (H04N5/92).

[0007]Howeveralthough the art which raises the quality of the picture signal which is recorded in a predetermined caseand records picture information is indicated by this conventional examplesince it is not aimed at the camcorderthere is no way of thinking which raises the quality of a screen for which a user wishes in it. By the waythe record method of video is described. When carrying out the digital recording of the videoit considers compressing and recording the amount of information. As a method for thisthere is an MPEG system like common knowledge.

[0008]Image coding systemssuch as an MPEG systemare shown also in the following literatureand it is common knowledge very much. From the firstMPEG is used as a general technical term nowalthough it is a name of the committee which examines the dynamic image code-ized method for accumulation.

(A) The magazine of Nikkei BP and October 11993 issuethe Nikkei electronics books, a data compression and digital modulation.

[0009](B) Maruzen Co.Ltd.June 30Heisei 3 issueYasuda ****** "international standards of multimedia coding."

(C) International Standard "ISO 11172 [standard]."

(D) CQa publishing companythe magazine of December 1Heisei 3 issue132 pages - 231 pages of an "interface" "an understanding of special edition:image data compressionand application."

[0010]Recording the signal which carried out the information compression on an optical disc by a discrete cosine transform etc. like this MPEG signal is shown also in JP3-224380A (H04N5/92).

[0011]
[Problem(s) to be Solved by the Invention]An object of this invention is to provide the record method of the camcorder which can record the picture for still pictures

for which a user wisheswhen recording the picture signal of the same scene on the field to which recording media differ as the object for animationsand an object for still pictures. An object of this invention is to be able to improve the quality of the picture signal of the scene for which a user wisheswhen quality can be changed and image data can be recordedand to provide the record method of an image recorder also with easy circuitry for it.

[0012]

[Means for Solving the Problem]A record method of a camcorder for MPEG signals of this invention will raise and record creation frequency of I pictureif it succeeds in prescribed operation at the time of record of animation compression coded data. A record method of a camcorder of this invention will raise and record quality of image data at the time of this operationif it sets during record of animation compression coded data and succeeds in predetermined operation.

[0013]If it succeeds in operation of still picture record into a recording animationa record method of a moving image recorder of this invention will evacuate image data at the time of this operationand will record said image data to which it was made to evacuate out of a recording animation period. If it succeeds in predetermined operation in a recording animation to a recording medium (14A)a record method of a moving image recorder of this inventionRecording position information in said recording medium (14A) of image data at the time of this operation is memorizedand said memorized recording position information is written in said recording medium (14A) at outside of a recording animation period.

[0014]A record method of a moving image recorder of this invention will memorize recording position information in said recording medium (14A) of image data at the time of this operationif it succeeds in predetermined operation in a recording animation to a recording medium (14A)and. Quality of this image data recorded is raisedit memorizes to said recording medium (14A)and said memorized recording position information is written in said recording medium (14A) at outside of a recording animation period.

[0015]

[Function]In the record method of the camcorder of this inventionif a user does predetermined operation at the time of record of animation compression coded dataa picture signal when [this] quality improves will be recorded. In the record method of the camcorder for MPEG signals of this inventionif a user does predetermined operation at the time of record of animation compression coded dataI picture will be recorded.

[0016]In the record method of the moving image recorder of this inventionif a user does predetermined operation at the time of a recording animationthe image data at this time will be evacuated and this image data to which it was made to evacuate will be recorded out of a recording animation period. In the record method of the moving image recorder of this inventionif a user does predetermined operation at the time of the recording animation to a recording mediumthe recording position information in said recording medium of the image data at this time is memorizedand said recording position information to which it was made to

evacuate is written in said recording medium at the outside of this recording animation period.

[0017]

[Example]The camcorder of the 1st example of this invention is explained referring to drawing 1. In drawing 1(10) is a camera part. (12) is an MPEG encoder. (14) is an optical recording disk drive part.

[0018](16) is a control section. (18) is a final controlling element. (20A) is a trigger switch for recording animations. (20B) is a shutter button for high resolution. This operation is explained. Firsta user pushes the switch (20A) of this camcorderand this is told to a control section (16).

[0019]A control section (16) makes each part operateand carries out video record. That isthe picture signal from a camera part (10) is inputted into an MPEG encoder (12)and is changed into an MPEG signal. This MPEG signal is outputted to an optical recording disk drive part (14)and is recorded on a magneto-optical disc (14A). Thena user pushes the switch (20A) of a camcorder againand this makes a control section (16) tradition ** and a control section (16) stop each part.

[0020]Operation when a user pushes the shutter button (20B) of this camcorder during above-mentioned moving image signal record is explained. If a control section (16) detects that this shutter button (20B) was operateda control section (16) will control an MPEG encoder (12) as the following. Firstthe quantization width of the picture at this time is set up finely compulsorilyand a quality picture is recorded.

[0021]Let the picture at this time be I picture. The GOP layer at this time comprises this one I picture. The occurrence frequency of I picture is raised between prescribed periods. In this 1st exampleat the time of operation of a shutter button (20B)quantization width is set up finely compulsorily and the quality picture is recorded. That isit is possible to record the screen which a user wishes to have with high quality.

[0022]In this 1st examplethe picture at the time of operation of a shutter button (20B) is compulsorily made into I picture. That isthe screen at the time of this shutter operation has prevented becoming P picture and B picture. It is not reproductionif you have no I picture (intra coded image) as they are prediction-coding picturessuch as P picture and B picture. Thereforein order to reproduce P picture and B pictureI picture must also be reproduced and processing is complicated. Thusaccording to this 1st examplethe screen which a user wishes to have is quickly renewable. Sometimesthere is usually no difference in image quality not much at the time of reproduction of I pictureP pictureand B picture. Howeversince I picture is created only from the picture signal in this frame like the above-mentionedimage quality hardly deteriorates. Thereforesince the screen which a user wishes to have is made into I picture according to this 1st examplethe minimum level of the grade of the quality of this screen can be guaranteed.

[0023]That isin this 1st examplecoding processing of the picture at the time of operation of this shutter button (20B) is compulsorily carried out as an I

pictureand this I picture of one sheet forms the GOP layer independently. The occurrence frequency of I picture is compulsorily raised in this 1st example between the predetermined short time after operation of this shutter button (20B). Thereforeeven if the operation timing of this shutter button (20B) shifts a littlethe picture of the neighborhood of this will be recorded as an I pictureand will be recorded like continuous shooting of a camera.

[0024]Thereforethe operation timing of a shutter button (20B) shifts a littleand a possibility that it is renewable as an I picture raises the picture of the neighborhood of this. If processings of **such as subdivision of the above-mentioned quantization width and I picture generation processingare considered from the data volume of MPEG signal coding processingnaturally data volume will increase by these processings. Thereforenaturallythe above-mentioned processing must be performed to such an extent that a buffer memory (not shown) with a built-in MPEG encoder (12) does not blow out.

[0025]The camcorder of the 2nd example of this invention is explained referring to drawing 2. In drawing 2identical codes were given to drawing 1 and identical parts. (20C) is a shutter button for still picture record. (22) is a temporary storage memory of still picture data. (24) is a switching circuit and is always connected to the MPEG encoder (12) side.

[0026]In this camcordera moving image signal avoids the inner circumference side of a magneto-optical disc (14A)and is recorded. Operation when a user pushes the shutter button (20C) of this camcorder during moving image signal record of this camcorder is explained. If a control section (16) detects that this shutter button (20C) was operateda control section (16) will carry out motion control as the following.

[0027]Firstthe picture signal at this time is stored in the temporary storage memory (22) of still picture data. This is performed whenever a shutter button (20C) is pushedand two or more still picture data is recorded on this temporary storage memory (22). And after moving image signal record with this camcorder is completeda control section (16) connects a switching circuit (24) to the temporary storage memory (22) side automatically.

[0028]And automaticallya control section (16) controls an optical recording disk drive part (14)and makes two or more still picture data from a temporary storage memory (22) outputand records this still picture data on the predetermined region by the side of the inner circumference of an optical recording disk (14A) one by one. Thusa still picture signal is recordable on the field by the side of the inner circumference of an optical recording disk (14A).

[0029]In this 2nd examplethe still picture data memorized by said temporary storage memory (22) is the data which carried out image compression coding using the MPEG encoder (12). Howeverthis application is not independently necessarily limited to this. That isthe compression technology of an animation and the compression technology of a still picture may be changed. For examplethe still picture data which has not performed compression processing may be sufficient as the still picture data recorded. Fractal compression processing may be performed

and recorded on still picture data. Although an animation is compressed with an MPEG systema still picture may be compressed with a well-known JPEG system (refer to the above-mentioned literature A and B and D). A still picture may be compressed by a DYUV methoda CLUT methodetc. which are defined by the written standards (green book) of CD-I. An animation may also be compressed by methods other than MPEG.

[0030]In this 2nd examplethe inner circumference side of an optical recording disk (14A) is made into a still-picture-data record sectionand the periphery of the optical recording disk (14A) is made into the moving image signal record section. Thereforea still picture and video are not intermingled and regeneration etc. do not become complicated. The recording position (address position) of the animation corresponding to this still picture is also recordedand it may be made to use for scene access like said JP4-326883A in this 2nd example at the time of still-picture-data record.

[0031]That iswhen carrying out scene accessthe still picture of a still picture field is reproduced one by one first. If a user operates moving-image-reproduction processing at the time of this still picture reproductionsince the animation corresponding to this still picture is recorded on reference in said recording positionthe usual moving-image-reproduction processing will be performed. In this 2nd exampletwo or more still picture data stored in the temporary storage memory (22) was automatically recorded on the predetermined region after the end of a recording animation.

[0032]Howeverit may be made to record this by time sharing. For examplea mass memory is adopted as a memory buffer with a built-in MPEG encoder (12). And if the MPEG signal corresponding to the moving image signal for several seconds is accumulatedwill read this MPEG signal by one 4 times [usual] the rate of thisand the optical disk drive (14) will be made to operate by 4Xand it will record. And if still picture data is stored in the temporary storage memory (22)the pickup (not shown) of an optical disk drive (14) will be moved to the inner circumference sideand still picture data will be made a magneto-optical disc (14A) at the time of record. And the video in these still-picture-data recording periods is accumulated in the memory buffer with a built-in MPEG encoder (12) by the MPEG signal. The pickup (not shown) of an optical disk drive (14) is moved to the periphery sideand the MPEG signal of an MPEG encoder (12) is recorded after the MPEG signal recorded [said]. And the still picture data of a temporary storage memory (22) is recorded after recorded still picture data like the above-mentioned.

[0033]The camcorder of the 3rd example of this invention is explained referring to drawing 3. In drawing 3identical codes were given to drawing 1 and drawing 2and identical parts. This 3rd example does not record still picture data on the inner circumference side of an optical recording disk (14A)but the data in which the recording position of the scene of an animation which the user wished is shown is recorded.

[0034](20D) is an index button. This operation is explained. Firsta user pushes the switch (20A) of this camcorderand this is told to a control section (16). A control

section (16) makes each part operateand carries out video record.

[0035]During this moving image signal recorda user pushes the index button (20D) of this camcorder. If a control section (16) detects that this index button (20D) was operateda control section (16) will set up compulsorily the quantization width of the MPEG signal pictures at this time finelyand will record a quality picture. Let image processing at this time be I picture.

[0036]And a control section (16) memorizes the recording position (address position) in the magneto-optical disc (14A) of the video at this time. This is performed whenever an index button (20D) is pushedand a control section (16) memorizes two or more recording positions (address position). And after moving image signal record with this camcorder is completeda control section (16) connects a switching circuit (24) to the control-section (16) side automatically.

[0037]And automaticallya control section (16) controls an optical recording disk drive part (16)and makes the data of a recording position output and records this data on the predetermined region by the side of the inner circumference of an optical recording disk (14A). Thusthe data of the recording position of a scene which the user chose is recorded on the field by the side of the inner circumference of an optical recording disk (14A).

[0038]When playing this optical recording disk (14A)the data of this recording position can be known first. Thereforeit is made to the reference in the case of searching the scene which a user wants to see. In this examplethe picture of the important scene where this index button (20D) is pushed is high-definition-izedand is recorded.

[0039]Although it is processing considering it as I picturemaking quantization width fine as high-definition-izing and quality improvement of a pictureetc. in this examplethis application is not independently necessarily restricted to thisthat ismay perform other coding compression processings and may be made to enlarge image size.

[0040]

[Effect of the Invention]According to this inventionthe quality of the picture for which a user wishes into a recording animation can be raised. According to this inventionaccess at the time of the reproduction to the scene which the user set up arbitrarily into the recording animation becomes easy.

[0041]According to this inventionthe same scene is recordable on the record section for animationsand the record section for still pictures.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a figure for describing the 1st example of this invention.
[Drawing 2]It is a figure for describing the 2nd example of this invention.
[Drawing 3]It is a figure for describing the 3rd example of this invention.
[Description of Notations]

(10) .. Camera part
(12) .. MPEG encoder
(14) .. Optical recording disk drive part
(14A) .. Magneto-optical disc (recording medium)
(16) .. Control section
(18) .. Final controlling element
(20A) .. Trigger switch
(20B) .. Shutter button
(20C) .. Shutter button
(20D) .. Index button
(22) .. Temporary storage memory
(24) .. Switching circuit